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Contributions to the Philosophy of Zoology. By R. Knox, M.D., F.R.S.E., &c.

Part I.—*On the Relation of Species or Race to Genus or Natural Family: a Question of Transcendental Anatomy.*

INTRODUCTION.

Zoology, to be esteemed a Science, must be based on philosophical principles. True, it is a science of observation and not of calculation; it has to deal with living bodies, and with the mysterious and hitherto undiscovered principle of life, whose laws are not to be explained by numbers, however multiplied, nor by a geometry, however refined. Fluxions avail not here, nor the integral calculus. Nevertheless, some great minds have shown that Zoology has its laws, which, despite difficulties almost innumerable, may be so inquired into as to evolve some truths of more import to man than at first appears.

The observation of nature is no doubt the first duty of every candid observer; next comes the duty of the inquirer into her laws, for the mere observance of a fact is of no value whatever, unless that fact be placed in its relations with all others. Men had observed, and no doubt observed carefully, long before the age of Aristotle, but he alone was equal to the production of the 'Historia Animalium.' He was followed, at a long interval, by Buffon and Linné; last came the immortal Cuvier. The discovery of the true signification of the fossil remains of the organic world by this illustrious and justly celebrated man, was unquestionably the most remarkable step ever made for the advancement of the human mind. The element of research he employed was the descriptive anatomy of the adult or fully-developed individual of all, or at least of most, of the species of animals now occupying the globe. The minute descriptive anatomy of the species, with a view to the rigorous determination of its true nature and position in a natural-history arrangement, seemed to be the ultimatum of all his inquiries; and if he spoke of genera or natural families it was more as a naturalist, or as one by whom generic distinctions were viewed rather as expressions of philosophic arrangement than as realities based in Nature. It was whilst pursuing this inquiry into the existing and living Fauna of the present world that the thought struck him of applying the element of research he then wielded with such dexterity to the fossil remains of a former world; never since man studied science had a thought so fruitful in great results entered the human mind. By it he dissected, as it were, the globe itself, giving to the lovers of truth in science a key wherewith to read those vestiges of successive animal forms which we, for want of a more correct term, call Vestiges of Creation, and removed from the mental vision of men that dark veil of ignorance which had certainly endured for some thousand years.

As Cuvier pursued his anatomical investigations, for they were strictly so, he classified and arranged the individual animals examined by him into distinct species, according to their anatomical differences; still, adhering to the anatomical method, he only viewed the distinctions as generic when they were wider, larger and quite apparent. Not that he despised external characters, or neglected them; but as an anatomist he felt himself bound to view them as secondary and of infinitely less importance than the anatomical. Moreover, they were wholly inapplicable, or nearly so, to the fossil world, at least to that class, the Vertebrata, in which man is most interested.

If the theory I am about to propose be true, that the young, namely, of every species, represents a *generic animal*, embracing in its structure and natural-history characters the *possible* of all the species, past, present and to come, belonging to the natural family of which it forms a portion, then the natural history of the fossil world might be guessed—might be restored, but not otherwise. The fossil horse was only a horse *generically;* but whether a horse properly so called, an ass, a zebra, a quagga, or none of these, none can now for certain say: the fossil tiger was no tiger, in all probability; nor the bear a bear, appertaining to, or to be classed with, any species now living. The exterior of the fossil world is lost for ever; all that is left of it being merely the fabulous traditions of rude ages, peopling the world with monsters, which the discoveries of Cuvier in some measure corroborated.

When the anatomical method failed in Cuvier's hands, as it often did, the illustrious discoverer was thrown upon the field of hypothesis. The seeming fixity of species was the first stumbling-block he encountered; this led to his theory of successive creations, if that can be called a theory which removes the inquiry at once from all further investigation. By anatomy it was not easy, occasionally impossible, to distinguish species from each other, which, when viewed as clothed with their external attributes, are obviously and notoriously distinct. In this predicament stood the lion and tiger, panther and leopard, horse, zebra, ass, dog, wolf, fox, jackall, pig, ox, man. The theory of variety, to a certain extent permanent, was next brought to bear on these difficult questions; the influence of domesticity was also invoked, and even the fruitfulness of hybrid races was asserted; so that Natural History fast retrograded towards the silly hypothesis ascribed to Aristotle, who is supposed to have conjectured that the vast variety of animal forms with which Africa abounds is due to the arid nature of the country and its paucity of rivers and springs, thus bringing together animals of many species and genera; hence the varied character of Afric's Fauna.

The inadequacy of anatomy to distinguish species in every case was fully admitted by Cuvier himself. I also admit this practically, but with this reservation, that the minute anatomy of even the osteology of every species differs in a certain degree, however slight, from every other; but such minute differences are not of much importance in the establishment of important principles, nor can they always be depended on. The nasal bones of the horse and ass differ in form from each other, more perhaps than any part of their respective osteology; but how insignificant is this difference, in a natural-history point of view, when compared with those external characters which mark the zebra, the horse, the ass, and quagga! The same remarks apply to the lion and tiger, in respect of these very bones, the nasal, and their relations to the superior maxillary bones; to the white ox of Scotland and to the common domestic ox. The nasal bones, the skeleton of the head, the character of the teeth, do not differ more regularly or constantly, nor to the same extent, in the horse, zebra and ass than they do in the races of man. The skeleton of the head of the Negro and Bosjesman differ much more widely from the white races of man than those of the horse and lion differ from the corresponding structures in the tiger and zebra. I do not, therefore, admit, to the full extent, that anatomical characters ever fail to discriminate species; but I freely admit their occasional inadequacy to characterise or to lead to the determination of species in a practical sense. On the other hand, the facility with which this may be done, by a consideration of the external characters, is known to all the world. Science admits of no exaggeration; Anatomy has done much for Natural History; much for Philosophy; still more for humanity, by purging the human mind of deep-rooted errors, of a gross and scandalous character, of forty centuries' growth. But Anatomy has its limits, notwithstanding, and these limits were admitted and defined by the Great Master himself.

It was not to be expected that a mine of knowledge such as was discovered and first worked by the great Cuvier should continue to be explored by so many vigorous hands, and that all should go smoothly with the labourers: difficulties soon appeared, and they increased so rapidly in number and in strength as to cloud with anxiety for the fate of his great discovery the mind of the immortal author of the 'Ossemens Fossiles.' It seemed as if he were about to survive his own vast reputation. So seemingly unimportant a question as the influence of domestication over animal life embarrassed the great anatomist. The anatomical element of inquiry having failed in establishing specific distinctions in the various oxen which ornament the cultivated earth, Cuvier was forced to imagine them to be like the dog, of one species; Goethe, the transcendentalist, starting from a higher point of view, had arrived at the same conclusion. "The infinite varieties of the domestic ox," observed the sublime author of 'Faust,' "are simply the gift to man of domesticity acting through millions of years." Such also was Cuvier's opinion, omitting the "millions of years." What his real opinions were on the influence of time and circumstances he never, so far as I know, communicated to any one. The monumental records of Egypt, depicting man then as he is now, after the lapse of at least 4000 years, were perfectly well known to him. Still greater difficulties he prudently passed by without a passing notice. And yet his great discovery laid the foundation of Geology, Palæontology, and a true history of life on the globe. Before him these sciences could not be said to exist.

Prior to this eventful scientific era the German school of philosophic anatomists had made an advance towards the same object, but from a different point of view. Anatomy was still the element of research which they employed, but it was the Anatomy of the embryo. At the head of this school was the justly-celebrated Goethe, poet, philosopher, naturalist, mathematician; his genius seemed universal. He it was who first distinctly formuled the law of unity of the organization in all that lives or has lived. The doctrine of "arrest of development" came soon after into vogue, chiefly through Meckel and the German schools of anatomists,—a doctrine based on a superficial and a somewhat incorrect application of facts, curious and important in themselves; to this at last were added the Teratologie of Etienne Geoffroy (St. Hilaire) and the serial unity of De Blainville.

Believing the transcendental in Anatomy to be the only instrument of research at present known by which a correct basis can be laid for the philosophy of Zoology, I have never ceased to study and teach it since the period (1811) when it first became known to me. To the writings of Vicq. d'Azyr I am indebted for the first hints of its existence. Biassed in favour of descriptive anatomy, I have ever objected to the too hasty adoption of extreme transcendental views, holding it to be a true maxim in science, as well as in social life, that the change or step in advance, in order to be certain and trustworthy, must ever be made with caution, and, if possible, supported by the demonstration of physical materials; or, in other words, the thought which genius submits to the world as an idea must become a physical demonstration before the world can fairly be called on to admit its truth. This is the view I take in the following Memoirs, in some of which it is my intention to apply the transcendental to Natural History as a preliminary to my inquiry into the natural history of man. The true relation of species or race to genus or natural family seemed to me to present a favourable mode of testing the value of the transcendental, not with any idea of testing its truth,—that has been settled long ago,—but of ascertaining its practical value as an instrument of research. The true relation of race to natural family being first discovered, it will then be time enough to apply the transcendental to the relation presumed to subsist between natural families, and, lastly, between these and the universal primæval life of the organic world of this globe.

In selecting the natural family of the Salmonidæ as a subject of research I have been guided by several considerations: I had already made them the subject of extended research, and their external characters offered favourable points of view for such an inquiry. It is chiefly to the exterior that I give my attention in the present Memoirs; the interior will follow. I commenced with the dentition, that natural-history character to which all, whether naturalists or anatomists, ascribe such importance; next followed a brief inquiry into the systems of coloration and proportion. To all these the transcendental applies, or ought to apply, if true. That it is true as a theory I have not a doubt myself, however I may fail in proving it to the satisfaction of others. My immediate object is to prove the existence of a *generic animal*, the product, no doubt, of hereditary descent from a species, but in itself including the characteristics of all the species belonging to that natural family; or, in other terms, proving hereditary descent to have a relation primarily to genus or natural family. By this term I endeavour to explain family likenesses commingling with the generic; the more or less resemblance, for example, of an individual with other affiliated races, to none of which it belongs by strict hereditary descent. My ultimate aim is to offer a scientific explanation of the appearance, from time to time, of seemingly new species on the earth, and of the extinction of others, thus restoring to legitimate science that branch of philosophy which the theory of successive creations, invented by Cuvier and still maintained by his followers, had clearly removed from it. To prove the unity of the organization, the unity of creation, and the serial unity of all that lives or has ever lived, forms the aim of the first part of this inquiry.

R. KNOX.

Meissen House, Upper Clapton,
September, 1855.

Entomological Botany (with more especial reference to the Plants frequented by the Tineina). By H. T. STAINTON, Esq.

(Continued from page 4777).

Lotus major. Greater Bird's-foot Trefoil.

It is probable that most of the species which feed upon L. corniculatus feed also on this plant; at any rate, the Nepticula (still not bred) does, as I found several of it in Headley Lane last month.

Astragalus Glycyphyllos. Sweet Milk Vetch; Wild Liquorice.

Speyer enumerates as feeding on this, Lycæna Cyllarus, Anthrocera Achilleæ, A. Hippocrepidis and A. Onobrychis, all species unknown to us as British, though it is extremely likely that we have yet to find more than one species of Anthrocera. Toxocampa lusoria, not yet detected in this country, feeds on this plant in May. Two species of Coleophora feed on this plant, neither of which has been found in this country, because neither has been looked for: they are C. Coronillæ and C. serenella. The former is most plentiful in August; it has a rather long case, without lappets; it eats again a little in May. C. serenella, whose personal acquaintance I made at Glogau and Stettin, where it seems to occur almost wherever the plant grows, feeds in September and again plentifully in May; the case is short, white and very broad, reminding one of a short lady with numerous flounces. This was the insect to which Réaumur gave the name of Teigne à falbalas. The mined places on the Astragalus leaves are of a pearly white and very conspicuous.

Vicia sylvatica. Wood Vetch.

An elegant climbing plant, most frequent in mountainous districts. It is fed upon by Psyche viciella and Toxocampa Viciæ, according to Speyer; but Gueuée gives Vicia dumetorum, which is not a British plant, as the food of the last-named species.

Vicia Cracca. Tufted Vetch.

A plant which from its long tufts of deep blue flowers early attracts our attention. It delights to grow in hedges and bushy places, and is often mercilessly stripped of its blossoms by the young botanist, who deems, on finding it, he has got a prize. This is the principal food-plant of Toxocampa pastinum, of which the larva feeds in May. Speyer also cites as feeding on it, Gnophos obfuscaria. No Tineina larva has hitherto been observed upon it.

Vicia Sepium. Bush Vetch.

Abundant in lanes and borders of woods, and one of the first of the genus which greets us in the spring with its dark purplish flowers. Speyer gives as feeding on this Ptychopoda remutata. Two years ago a Tortrix? larva was observed on this plant, and also on Lathyrus pratensis, feeding in September and October, between two united leaflets, of which it devours the inner epidermis: these larvæ, though not uncommon, all perished in the winter, and we are unaware to what species they should be referred. This plant is, however, most notorious for being the favourite food-plant of the lovely Lithocolletis Bremiella. This species, according to Professor Frey, of Zurich, frequents those plants which grow in shady borders of woods, mining the *under side* of the leaf; the larva appearing in July and again in September and October.

Pisum. Pea.

Speyer mentions as feeding on this, Calocampa vetusta and C. exoleta, Mamestra Pisi, Noctua brunnea and Endopisa nebritana. I am not aware of any Tineina larvæ attached to it whilst in a growing state, though dry peas are eaten very readily by Endrosis fenestrella and Œcophora pseudo-spretella.

Lathyrus pratensis. Meadow Vetchling.

Speyer gives as feeding on this plant, which is very common with us in meadows and hedges, two species not known as British, Orgyia selenitica and Fidonia glarearia. The Tortrix larva, already mentioned under Vicia Sepium, feeds on this plant in September and October; and a Coleophora larva has been observed on this plant (according to Tischer), but there is some doubt to which species it should be referred.

Orobus niger. Black Bitter Vetch.

A very scarce British plant, yet cited by Speyer, on Tischer's authority, as the especial food of Ephippiphora Loderana. It *may*, however, feed on other and commoner species of the same genus.

Ornithopus perpusillus. Bird's-foot.

Common on dry sandy and gravelly heaths, but easily overlooked from its prostrate habit. Speyer mentions as feeding on it Anthrocera fausta and Eyprepia Hebe, but the larva of the latter appears quite polyphagous. It is hardly necessary to add that neither of these species is known as British.

Hippocrepis comosa. Horse-shoe Vetch.

Common in chalky places, but probably confounded by the uninitiated with Lotus corniculatus, which it much resembles; the leaves, however, are pinnate instead of trefoil-form, and thus it may be immediately distinguished. Hübner represents the larva of Polyommatus Corydon as feeding on this plant, and it is on it that I am disposed to think that the larva of Coleophora niveicostella will be found to feed.

Persica vulgaris. Peach.

Speyer mentions as feeding on this, Papilio Podalirius, Anthophila communimacula (a species not alluded to in Guenée's Noctuelites), Tortrix cerasana and Cerostoma persicella. Tortrix cerasana, as we know very well, is tolerably polyphagous; but no other food-plant has yet been assigned to Cerostoma persicella, which may some day put in its claim to be naturalized amongst us, as many another insect of extraneous origin has already done. The larva of Anarsia lineatella, figured in Fischer-von-Röslerstamm, plate 94, feeds on the young shoots of the peach in early spring, boring down the stem of the shoot and causing the terminal leaves to droop. It is very injurious to the plants it attacks, and is much dreaded by the gardeners of Vienna and Berlin. It has not yet been found in this country, but as, according to Fischer, it has occurred on the plum-tree, and indeed Fischer suspects it also feeds on sloe, the chances of our finding it here are very considerable.

Prunus domestica. Plum.

Speyer enumerates the following species as feeding on this plant:—*Papilio Podalirius*, Pieris Cratægi, Thecla Pruni, T. Betulæ, Trochilium culiciforme, Liparis dispar, Porthesia chrysorrhæa, P. auriflua, Orgyia gonostigma, O. antiqua, Eriogaster lanestris, Clisiocampa neustria, *Gastropacha Pruni*, Acronycta tridens, A. Psi, A. Rumicis, Orthosia instabilis, O. stabilis, O. munda, Amphipyra pyramidea, *Miselia culta*, M. Oxyacanthæ, Xylina rhizolitha, X. petrificata, *Catocala paranympha*, Ennomos alniaria, E. lunaria, E. illunaria, E. illustraria, Ourapteryx sambucaria, Rumia cratægata, Angerona prunaria, Chlorochroma vernaria, Hibernia leucophæaria, H. defoliaria, Boarmia rhomboidaria, Tephrosia crepuscularia, Biston betularia, B. hirtaria, B. prodromaria, Coremia fluctuata, Eupithecia rectangulata, *Tortrix diversana*, T. cratægana, Penthina prunina, P. variegana, Carpocapsa Wæberiana, C. pomonana, Exapate gelatella, Cerostoma scabrella, C. asperella, Swammerdamia pyrella, Coleophora anatipennella; he also mentions Pterophorus pentadactylus, which we know feeds only on Convolvulus; and this capital error shows with what caution all the preceding statements must be received. In the foregoing list the species not yet detected in this country are designated by Italics.

The most important plum-feeder that we know is Opadia funebrana, the larva of which feeds in the inside of the fruit of the plum. All eaters of plum-pie must have observed that some plums have the stone embedded in a layer of little brown grains, which are in fact the "frass" of this larva, though when we see this "frass" in a boiled state and swimming in juice, unless we are entomological enough to know what it is, it eats very well.

"What the eye don't see, the heart don't feel."

Strange that an insect so common that we see it by dozens in our plates is so seldom met with by entomologists that it is to be found in very few collections!—but the habit of the perfect insect is very retired, and when sitting on the stem of the plum-tree, from its uniform dingy colour, it is not very easily recognized.

Nepticula plagicolella, though most at home on the sloe, mines the leaves of the plum also very readily; and it is probable that many other sloe-feeders will be found also to occur on the plum.

H. T. STAINTON.

Mountsfield, Lewisham,
September 8, 1855.

Synonymic List of the British Carnivorous Water Beetles, together with Critical Remarks, and Notices of Foreign Allied Species.

By the Rev. HAMLET CLARK, M.A.

ANY one who takes the trouble to compare our lists of British Hydrocantharidæ and Philhydrida with those of other European countries, as Austria, France, Sweden, comes at once to the conclusion that we cannot compete with them; ours are manifestly inferior; we can boast neither of the same number nor the same variety of species. Why is this? How is it that, in the genus Hydroporus, Schaum's excellent list of our native species gives but forty-two, while Fairmaire, representing France, can bring forward his sixty-six species? It must proceed from one of two causes; either our islands are comparatively unproductive, or our field naturalists have been inattentive. And yet, with regard to the former, if we may argue from analogy and from other departments of Nature, Britain is not so entirely barren; our Flora is certainly creditable; our lists of birds are respectable; fishes, and mollusks and Echinodermata frequent our shores, and Diatomaceæ and Desmidiæ our peat districts, at least in proportion to those of our neighbours; nay, even as to insect life, we discover—thanks to the energy of some among us—that in Micro-Lepidoptera we are considered preeminent: can it be that in Coleoptera alone, and especially in those groups of the order which are protected by their habitats from many of the vicissitudes and accidents of ordinary beetle-life, and live and die in their native waters from generation to generation undisturbed, we are so inferior? I for one am convinced that it is not so; and that our confessed inferiority proceeds simply from the absence of investigation. I remember of course the small geographical area of Great Britain compared with the extent of other countries with their richer Faunas, but I can find in this no sufficient explanation. We have in the Western Islands and Orkneys our Lapland and Sweden; in Perthshire and the Highlands our Alps; in the southern coasts of England and Ireland our France and Germany: in short, by our natural variety of soil and climate, we have, and in approximating latitudes, many of the peculiar physical characteristics of other countries.

That investigation may be quickened among us, and that these unknown but interesting groups may receive increased attention, I have, in as few words as possible, described other species, found on the Continent, but at present unrepresented here: I might have extended them numerically, but have introduced (in parentheses and without numerals) *those only which I believe may probably be found in this country:* the capture of *four or five* additional species, without any corresponding effort, during the past year, will show that this anticipation is not absolutely chimerical.

It will be understood, then, that this catalogue does not profess to be accurate; rather, that it professes to be inaccurate; that it is merely approximating and suggestive; and that criticism, species by species, amendments and corrections, will be welcome proof of its value.

I have assumed that it will fall into the hands chiefly of those who have some knowledge of our present British species; I have not therefore described these, and others only relatively by their approximating and distinctive characteristics: in the hope, however, that others may be led to take up the study of these groups, I will add a few suggestions as to practical collecting. The apparatus is simple; a couple of well-corked, wide-mouthed phials, containing bruised laurel leaves or a few drops of chloroform on blotting-paper; a water-net of cheese-cloth on a steel hoop of 16 or 18 inches diameter, with joints so as to fold up in the pocket; an oil-skin bag as a cover; and a walking-stick with ferrule, to which the net is screwed, is all that is necessary.

And as to the localities to be visited—ditches in which are clumps of Sphagnum, or tangled masses of any water-plants; any place, in fact, that affords shelter will be sure to afford insects. I have taken, in Norfolk, a dozen specimens of Colymbetes Grapii at one dip, by securing a handful of hay floating on the top of the water; and in a lake in Scotland I was only successful in taking species by sinking in the water little bundles of grass and heather, and examining them day by day. Water-plants of all kinds, and especially those at the *ends* of ditches, will repay examination: on the moors and mountains species are found in abundance, not only in pools, but in little bits of marsh, where the net must be scraped along the ground in order to get up any water; rivulets and pebbly brooks have their peculiar representatives that frequent not aquatic plants, but the margins of pebbles; species of the genera Elmis and Hydræna may often be taken by removing with the hand stones from the bottom of brooks, and examining their under-surface; while muddy banks are tenanted by Heteroceri and some species of Cercyon. Although, however, these are the most productive localities, it is often advantageous to search those that *appear the most unproductive.* I have taken good Hydropori in a horse-tank: when adjoining ditches, promising in appearance, were barren, recently-flooded grass fields have produced insects not to be met with under usual circumstances; and I recollect that I first captured Hydrop. geminus, in the utmost profusion, in the filthy mud of one of the Huntingdonshire Fen lodes, when nothing whatever was to be found in the ordinary localities.

With reference to the important subject of the due preparation of specimens when taken for the cabinet, I cannot do better than refer your readers, especially such as are commencing the study, to the capital remarks of my friend Mr. Wollaston, in the second edition of Mr. Stainton's 'Entomologist's Annual' for this year. If the collector has but little time for arranging smaller specimens, during his entomological excursions, I recommend Mr. Wollaston's plan of setting out promiscuously the choicest examples on large pieces of framed card-board, to be cut out, pinned and arranged hereafter at leisure; this plan, however, requires *ample time* and *abundant leisure*: to those who can command less time for future setting out I should recommend the plan, which I as frequently adopt, of having in the travelling-case small oblong cards, of two or three sizes, neatly cut, which may receive at once single or pairs of specimens, and which, *without any further preparation* of cutting or pinning, are ready to be catalogued forthwith, and forwarded to entomological friends, or consigned to the cabinet. Both plans are good, and the adoption of either will produce a neat, well-disposed collection. I shall have pleasure in sending to any Coleopterist some of my cards, which are printed on one side with a copper-plate, for the purpose of being more accurately cut.

With regard to the season for collecting; in opposition to the requirements of other insect-life, all months are more or less productive. June is the height of the season; but owing to the protection which these families have from extremes of temperature, no month is without its representatives. I have taken many species *from under the ice*, and indeed the scarce species, Hydrop. oblongus, *Steph.*, and Agabus striolatus, *Gyll.*, and probably others, are to be taken freely *only* in the months of February and March. Many of us have forgotten that these insects are far better protected against the rigours of frost than we are; and so, by following the old-fashioned custom of collecting only when the sun shines, we fail to obtain probably many species which are now either of the rarest, or altogether unknown.

So far as we know, there is but one of our native species that is eminently *nocturnal* in its habits—Orectochilus villosus.

I have been making, during the summer, some experiments as to the practicability of keeping these insects in vivariums; and have succeeded, at least so far as to be able to recommend the subject to any who would desire to enter upon an untrodden field of research, or even to those who would view vivariums merely as interesting subjects for their drawing-room windows.

I believe that a careful study of these groups *when alive,* and when subject only to conditions which affect their natural state, will reveal to us very much of their habits, of which we are now so confessedly ignorant: we know nothing of the period of their larva and pupa states, of their metamorphoses, of their distinctive specific habits; nay, we are unable to recognize the insect at all as a pupa or larva.

All this and much more has to be learned; and all this and much more may readily be discovered by any who will give a little patient attention to the subject of vivaria. I have no doubt whatever that it is within the power of almost any one of your readers to throw much light upon these very interesting questions; and this, not by devoting himself entirely to the study, but as an amusement, by merely attending to the natural requirements of the species, keeping up a proportionate supply of vegetable life, spending a few minutes *de die in diem* in watching them, and carefully recording on paper, which should always lie near the vivarium, whatever he sees with his eyes.

I have throughout the following catalogue noted the size of each species in French millimetres; I have done so because, in the absence of specimens, I found it very difficult to give their exact value *in lines* without either producing unwieldy fractions, or deviating from strict accuracy; I have hence followed the Continental system of measurement.

Genus DYTISCUS.

(D. latissimus, *Linn.*, *Fab.*, *Oliv.* Long. 40; larg. 25. The largest of the genus, known at once by its largely-dilated elytra; not uncommon in northern countries of Europe. Rare in France.)

1. D. circumcinctus, *Ahrens, Gyll., Steph., Sturm.* ♀ *elytris sulcatis,* D. dubius, *Gyll., Aubé.* D. angustatus, *Steph.* Long. 30—33; larg. 15—17. Whittlesea Mere; near Cambridge.

2. D. marginalis, *Linn.* D. submarginalis, *Steph.* ♀ *elytris lævibus,* D. conformis, *Kunz., Steph., Aubé.* Common everywhere.

3. D. circumflexus, *Fab.* ♀ *elytris sulcatis,* D. perplexus, *Aubé.* Near London; Mr. Newman has taken it at Peckham.

4. D. lapponicus, *Gyll., Germ., Zetterst.* D. septentrionalis, *Gyll.* Long. 25—28; larg. 14—15. Pitchy brown, beneath testaceous, margins of thorax and sides of elytra bordered with yellow, along the elytra are 18 or 20 faint luteous lines: may readily be distinguished by its smaller size, and the frequent luteous lines on elytra. I took this insect in the Isle of Mull, September, 1854.

5. D. punctulatus, *Fab., Steph.,* &c. Common.

6. D. dimidiatus, *Bergst., Steph.* Not so common as D. punctulatus, but generally distributed.

Genus CYBISTER.

1. C. Roeselii, *Fab.* Long. 30—33; larg. 16—18. Certainly rare in England; Stephens notices a specimen taken at end of September, 1826, at Walton, in Essex; also near Colchester, *Steph. Man.* Dr. Power informs me that it has been taken at Southchurch.

Genus PÆLOBIUS.

1. P. Hermanni.

Genus ACILIUS.

1. A. sulcatus, *Linn.* A. scoticus, *Steph. Ill.*

2. A. fasciatus, *Degeer, Erich., Steph. Man.* A. canaliculatus, *Nicol., Steph., Aubé.* A. caliginosus, *Curtis.* A. sulcipennis, *Sahlb.* A. dispar, *Zieg.* Not so abundant as A. sulcatus. Whittlesea Mere; near Edinburgh.

Genus HYDATICUS.

1. H. stagnalis, *Fab., Gyll., Steph.,* &c. Long. 14; larg. 7½. The introduction of this species to our lists rests upon two specimens, one taken by Dr. Leach "in a pond near Exeter," the other by the Rev. F. W. Hope "in a pond at Netley."

(H. austriacus, *Dej., Sturm.* Long. 12½—13; larg. 7½—7¾. Closely allied to H. cinereus; it is however somewhat smaller and more oval;

sides of thorax not so rounded; the yellow transverse band of the thorax narrower. France, Austria; probably in other northern countries of Europe.)

2. H. cinereus, *Payk.*, *Gyll.*, *Curt.*, *Steph.* Long. 14—15; larg. 8—8½. By no means common. Cambridge and Huntingdon Fens.

(H. bilineatus, *Deg.*, *Payk.* Long. 15; larg. 9—9½. Closely allied to H. cinereus; to be distinguished by flatter body, and by broader band on thorax. North of Europe.)

(H. zonatus, *Fab.*, *Panz.*, *Dej.* Long. 14—15; larg. 8—8½. Allied to H. austriacus and H. cinereus: it differs slightly in form, and especially in the disposition of the black transverse bands on thorax, which *leave the anterior and posterior margins yellow*. North of Europe.)

(H. verrucifer, *Sahlb.* Long. 14—15; larg. 8—8½. May be recognized at once by the peculiar striæ on the thorax all converging to its centre. Finland; Lapland.)

3. H. Hybneri, *Fab.*, *Oliv.*, *Sch.* Not common. Whittlesea Mere and Yaxley are the only localities in which I have taken it; Mr. Hope has found it at Netley; Mr. Newman has taken it at Camberwell and Lee.

4. H. transversalis, *Fab.*, *Panz.*, *Steph.* Though not abundant, the most common species of the genus. Cambridge, Norfolk, Whittlesea. It would seem that no representative of this genus has been detected either in Scotland or Ireland.

Genus Colymbetes.

1. C. fuscus, *Linn.*, *Fab.*, *Gyll.*, *Sturm*, *Steph.* C. striatus, *Aubé*, *Steph. Man.* C. Paykulli, *Steph. Man.* Long. 16—18; larg. 8—9. Common.

(C. striatus, *Linn.* C. Bogemanni, *Aubé*, *Gyll.* Long. 17—18; larg. 8—8½. With other distinguishing characteristics, the transverse striæ of elytra sufficiently designate this species. North of Europe.)

(C. dolabratus, *Payk.*, *Gyll.* Long. 15—16; larg. 7½—8. Hardly distinct from C. striatus; it is always smaller, relatively narrower; not dilated behind the middle. North of Europe.)

2. C. pulverosus, *Steph.*, *Sturm*, *Erich.* C. conspersus, *Gyll.*, *Aubé.* Apparently more common near London than in any other district.

3. C. notatus, *Fab.*, *Gyll.*, *Steph.*, *Aubé.* This insect sometimes occurs in considerable numbers in the fen districts; Wandsworth

Common, Norfolk, Carlisle, Southend, Bottisham, Dollar, Falkirk, Berwickshire.

4. C. exoletus, *Forst.*, *St.* C. collaris, *Payk.*, *Gyll.*, *Erichs.*, *Aubé.* Not uncommon in Huntingdonshire; near London; Carlisle, Prestwick Car.

5. C. bistriatus, *Bergst.*, *Erichs.*, *Steph.* C. agilis, *Payk.*, *Gyll.*, *Steph.*, *Aubé.* Rare in England; more common in Scotland; Norfolk, Kensington, Cambridge, Dollar, Swinton; near Glasgow; Paisley; Oban, common.

6. C. adspersus, *Fab.*, *Gyll.*, *Steph.*, *Aubé.* The rarest of the genus: I have never been so fortunate as to meet with it, though some years ago it was frequently taken by collectors. It is *shorter* and *relatively broader* than any of the allied species.

7. C. Grapii, *Gyll.*, *Steph.*, *Erich.*, *Aubé.* C. niger, *Lacord.* Not uncommon in the fens of Cambridgeshire; rarer near London. Mr. Newman has taken it abundantly at Birch Wood, in Kent.

Genus ILYBIUS.

1. I. ater, *Degeer*, *Fab.*, *Gyll.*, *Steph.* I. quadrinotatus, *Steph.*? Common.

2. I. obscurus, *Marsh*, *Steph.* I. quadriguttattus, *Lacord*, *Erich.* Common.

(I. Prescotti, *Mannerh.*, *Aubé.* Appears to be simply a variety of I. fenestratus, taken at Petersburg. Colour castaneous instead of piceous.)

3. I. fenestratus, *Fab.*, *Gyll.*, *Steph.*, *Aubé.* I. subæneus, *Steph.* I. lacustris, *Fab.* Local: occasionally in the fens; Welton Place, near Daventry; Croydon Canal, Parley Copse, Leominster.

4. I. guttiger, *Gyll.*, *Steph.*, *Erich.*, *Aubé.* More common in northern counties than near London; Bewdley Forest, Gosforth, Paisley.

5. I. angustior, *Gyll.*, *Steph.*, *Erich.*, *Aubé.* London district, Whittlesea Mere, Whitsunbank Hill. This local species has more recently been discovered by Dr. Power at Woking, and taken in some abundance by the London entomologists. It is most closely allied to the preceding species, I. guttiger; and though it is possibly distinct, I am not able to discover any clear, satisfactory specific characteristics.

(I. meridionalis, *Dej.* Allied to I. uliginosus; the same form, but broader; colour darker, of a different metallic tint; elytra without the distinct marginal band of the following species.)

6. I. uliginosus, *Linn.* I. fuliginosus, *Fab.*, *Gyll.*, *Steph.*, *Aubé.* D. lacustris, *Panz.* A most abundant species.

Genus Agabus.

(A. serricornis, *Payk.*, *Gyll.* Long. 9—11; larg. 5—6. Oblongo-ovate; nigro-piceous, very slightly æneous; sides of thorax continued in same arc as sides of elytra; sides of elytra and thorax broadly, but indistinctly, ferruginous. In ♂ four terminal joints of antenna dilated. France, Sweden, Lapland, Finland.)

1. A. agilis, *Fab.*, *Erich.*, *Steph. Man.* A. oblongus, *Ill.*, *Gyll.*, *Steph. Illust.*, *Aubé.* D. hæmorrhoidalis, *Fab.*, var. A. ruficollis, *Schaller.* Yaxley; Cambridge; near London; Raehills, Dumfriesshire.

2. A. arcticus, *Payk.*, *Gyll.*, *Steph.* Scotland, Dollar, Isle of Mull; Orkney, August, 1855.

3. A. guttatus, *Payk.*, *Gyll.*, *Steph.*, *Aubé.* Long. 8—9; larg. 4—4½. Common.

(A. dilatatus, *Brull.*, *Aubé.* Long. 8½; larg. 4⅔. Allied to A. guttatus, somewhat larger; elytra not so dark, with a more decided brown; more finely reticulated: probably it will prove to be a local variety. Moræa, France.)

(A. biguttatus, *Oliv.*, *Fairmaire.* Long. 9; larg. 5. Differs from A. dilatatus by its colour, entirely black and shining, more convex in form; differs from A. guttatus in general form, less parallel and more convex, as well as by its greater brilliancy of colour; the reticulations are much less distinct than on A. guttatus. France, Spain, Italy, Sicily.)

4. A. fontinalis, *Steph.*, *Ill.* A. guttatus, var., *Steph. Man.* A. vittiger, *Steph.*, not *Gyll.*, *Aubé.* By no means an abundant species. Devonshire, Sussex, Dorchester; Mr. Newman has taken it this autumn on Car Caradoc, in Shropshire. This insect may be determined at once by the third tooth on the anterior feet of the male.

(A. Hæffneri, *Mannerh.* Long. 7¼; larg. 3¾. Evidently smaller than A. guttatus, comparatively rather shorter, more finely reticulated; the three lines on the elytra are less distinct: the posterior angles of the thorax more obtuse and almost rounded. Sweden.)

(A. Wasastjernæ, *Sahlb.* Long. 7½; larg. 3¾. However closely resembling (by descriptions) the former species, it appears to be distinct: thorax less rounded on sides, posterior angles of thorax sharper, and in no degree rounded, punctuation of elytra more distinct. Lapland, Finland.)

5. A. chalconotus, *Panz.*, *Ill.*, *Steph.* A. cyaneus, *Steph. Illust.*, var. A. montanus, *Steph.* A. nigro-æneus, *Marsh*, *Steph.*, not *Erich.* A. aterrimus, *Steph.* A variable and common species. Long. 8—10; larg. 4½—5½.

6. A. affinis, *Payk.*, *Gyll.*, *Steph.*, *Sturm.* C. branchiatus, *Bab.*, *Steph.* Long. 6⅓—7¼; larg. 3¾—4. Not common. Near London; Netley, Norfolk, Cambridge. I have found this species more abundantly on chalk than other soils.

(A. elongatulus, *Gyll.* Long. 8; larg. 3⅔. Allied to A. affinis, but longer; posterior angles of thorax more rounded, and not pointing backwards towards elytra; colour of elytra black, with a broad and indistinct margin of brown. Lapland.)

7. A. striolatus, *Gyll.*, *Aubé.* A. rectus, *Bab.* Long. 8; larg. 4¼. Oval, elongated, rounded behind, black, scarcely shining; head black, with labrum and two spots in front ferruginous; antennæ and palpi ferruginous; thorax black with narrow lateral margins of yellow, covered with linear impressions pointing in all directions; elytra with impressions less distinct: black, without spots, with three almost obsolete lines of punctures; legs ferruginous. This insect, by some oversight, is omitted in Schaum's list: according to Babington (Ann. Nat. Hist. vol. vi. p. 54) it was first discovered in Horning Marshes by the Rev. J. L. Brown, in March, 1839; and again in March, 1840. In May, 1855, I took a single specimen in the same locality.

(A. vittiger, *Gyll.*, *Erich.* Long. 7½; larg. 3¾. Body more oval, less parallel than A. striolatus; thorax simply and distinctly reticulated; elytra more convex; black, with a short longitudinal line, hardly visible, placed near the middle of length, and some distance from external margin. North of Europe.)

(A. melanarius, *Aubé.* Long. 8½; larg. 4¾. Differs from A. striolatus by its rather larger size, form more oval, the less generally longitudinal direction of the linear punctures on elytra, and also by a ferruginous narrow band at their margin, visible only when the insect is wetted: differs from A. vittiger, among other peculiarities, by the frequent linear impressions on thorax, pointing in all directions, as in A. striolatus.)

8. A. paludosus, *Fab.*, *Gyll.*, *Steph.* A. striolatus, *Steph.*, not *Gyll.* Not rare: generally found throughout the country in running water.

9. A. congener, *Payk.*, *Gyll.*, *Steph.* A. confinis, *Steph.*, not *Gyll.* Long. 7½—8; larg. 4¼—4½. Suffolk, Norfolk; rare near London: but little is known of the localities or habits of this insect.

(A. confinis, *Gyll.*, *Sahlb.* Long. 8½—9½; larg. 4¾—5. Head and thorax black, without the narrow ferruginous border of A. congener; elytra slightly elongate, dark brown, with lateral borders cloudily but broadly testaceous; with 3 longitudinal lines of punctures; smooth, not reticulated as in A. congener. North of Europe, Sweden, Finland.)

(A. nigricollis, *Zoubkoff.* Long. 9; larg. 4¾. Head black, labrum and two spots in anterior red; thorax black, lateral margins slightly ferruginous; elytra slightly elongated behind, varying in colour from pitchy brown to bright red-brown; with two spots, hardly, sometimes not at all, visible, one on external margin, the other at apex.)

10. A. femoralis, *Payk.*, *Gyll.*, *Steph.*, *Sturm.* A. assimilis, *Sturm*, *Aubé.* Near London; Cambridge; generally distributed.

11. A. uliginosus, *Payk.*, *Gyll.*, *Sturm.* Long. 7; larg. 4. Southend; Windsor; rare near Edinburgh; Aberdeenshire. Rare. A. dispar, *Bold* (Zool. 1849, xxiv.), must be referred to this species, as I have ascertained by comparison of a fine series which Mr. Bold obligingly allowed me to examine.

(A. fuscipennis, *Payk.* Long. 9½—10; larg. 5½—5¾. Fuscous; thorax dark brown, irregularly punctuated with a few more deeply impressed punctures on anterior margin; lateral borders broadly ferruginous, anterior narrowly; elytra oval, considerably dilated in front of the middle; colour and broad lateral margins in thorax, punctuation more fine. North of Europe.)

(A. Reichii, *Aubé.* Long. 7½; larg. 4½. Closely allied to A. uliginosus: differs in form, which is more convex, and by the greater dilatation of elytra a little in front of the middle: it appears to correspond in colour and punctuation entirely with A. uliginosus.)

12. A. abbreviatus, *Fab.*, *Gyll.*, *Steph.*, *Aubé.* A common species in the Fen districts; Windsor; Mr. Newman has taken it at Leominster.

13. A. maculatus, *Linn.*, *Fab.*, *Steph.* Frequents especially brooks and running water throughout the kingdom: dark varieties are occasionally met with.

14. A. vitreus, *Payk.* A. didymus, *Oliv.*, *Aubé.* Generally distributed, but not abundant.

15. A. bipunctatus, *Fab.*, *Gyll.*, *Aubé.* A. nebulosus, *Forst.*, *Steph.* Very common.

16. A. conspersus, *Marsh*, *Steph.* A. subnebulosus, *Steph.*, *Aubé.* Aldborough, Suffolk; near Northampton; Musselburgh.

17. A. brunneus, *Fab.*, *Aubé*, *Steph. Man.* D. castaneus, *Sch.* C. ferrugineus, *Steph. Ill.* Rare. South Devon, by Dr. Leach in spring of 1825; Dartmoor; near Caernarvon: I am indebted to Dr. Power for specimens which he took in the New Forest.

18. A. Sturmii, *Schönh.*, *Gyll.*, *Steph.*, *Aubé.* Abundant.

19. A. bipustulatus, *Linn.*, *Fab.*, *Steph.* A. carbonarius, *Fab.*, *Gyll.* Abundant.

(*Var.* C. Snowdonius, *Newm.*, *Steph.* This is an interesting form: I think it cannot be regarded a species, but as an extreme mountain variety of A. bipustulatus. Mr. Newman has obligingly forwarded to me one of his few remaining specimens; I have scores in my cabinet and boxes of A. bipustulatus, but have none that approach the peculiarities of this example,—the two foveæ at base of prothorax, and the very apparent posterior attenuation of elytra: I notice the subject here, as it would be very desirable if a *series* of the insect could be obtained from Snowdon; single examples are always unsatisfactory as the basis of an opinion in questions of doubt.

(A. subtilis, *Er.* Differs from A. bipustulatus by its smaller size, more convex form; elytra more finely striolated and reticulated.)

(A. Solieri, *Aubé.* A. alpestris, *Heer.* Long. 10; larg. 5¼. Allied to A. bipustulatus, but is distinct by its narrower form; more depressed; mouth narrower, and more prominent; thorax smaller, *rounded* at the sides, with posterior angles obtuse; sides of elytra more parallel. Pyrenees, Vernet, Grenoble, Savoy.)

Genus NOTERUS.

1. N. crassicornis, *Fab.*, *Gyll.*, *Steph.* N. capricornis, *Herbst*, *Sturm.*

2. N. semipunctatus, *Fab.*, *Erich.*, *Steph. Man.* N. sparsus, *Marsh*, *Curt.*, *Steph. Illust.* Long. 5; larg. 2¼.

(N. lævis, *Dej.*, *Sturm.* Long. 4½; larg. 2½. Approaches in form N. semipunctatus, in antennæ N. crassicornis: may be distinguished from both by the smoothness of the elytra, the few impressions upon which are very minute. France and other countries.)

Genus LACCOPHILUS.

1. L. minutus, *Lin.*, *Fab.*, *Erich.*, *Steph.* L. interruptus, *Panz.*, *Aubé.* L. hyalinus, *Marsh*, *Steph.* Long. 5; larg. 2¾.

2. L. hyalinus, *Deg.*, *Erich.*, *Steph.* L. minutus, *Marsh*, *Steph.*, *Aubé.* L. obscurus, *Panz.* Long. 4¾; larg. 2⅔.

(L. testaceus, *Aubé.* Long. 5; larg. 3. Broader and more convex than L. hyalinus; without the longitudinal markings on elytra which distinguish L minutus. France, &c.)

(L. variegatus, *Germ.*, *Sturm.* Long. 4; larg. 2⅕. At once known by the broad luteous transverse bands on elytra, interrupted at the suture; one a little removed from the base, the other behind the middle. France.)

Genus Hyphidrus.

1. H. ovatus, *Linn.* ♂, *Steph.*, *Erich.*, *Aubé.* D. ferrugineus, *Linn.* ♀, *Don.* H. ovalis, *Fab.*, *Gyll.* ♂. H. gibbus, *Fab.*, *Gyll.* ♀. *Var.* H. variegatus, *Steph.*

(H. variegatus, *Illig.*, *Dej.* Long. 4½; larg. 3. Size of H. ovatus: at once distinguishable by its markings on elytra. France.)

Genus Cnemidotus.

1. C. cæsus, *Dufts.*, *Gyll.*, *Steph.*, *Aubé*, *Erich.* C. impressus, *Panz.* Near London; Fen districts, Northampton, &c.

(C. rotundatus, *Aubé*, *Fairmaire.* Long. 3⅔; larg. 2. Distinct from C. cæsus by brighter colour, form broader and more rounded, punctuation more deep and distinct. France.)

Genus Hydroporus.

1. H. inæqualis, *Fab.*, *Gyll.* Hygrotus reticulatus, *Steph.* Long. 3; larg. 2.

2. H. reticulatus, *Fab.*, *Gyll.*, *Erich.*, *Aubé.* Hygrotus collaris, *Fab.*, *Steph.* H. affinis, *Steph. Ill.* Long. 3¼; larg. 2.

(H. quinque-lineatus, *Zett.* Long. 3¼; larg. 2. Allied to H. reticulatus, which it resembles in size, form and maculation; it differs in punctuation; in H. reticulatus the elytra are densely covered with fine punctures interspersed with others deep and decided: in 5-lineatus the surface of elytra is covered with deep punctures. Lapland.)

3. H. decoratus, *Gyll.* Near York; Norfolk; near London; Northamptonshire. Long. 2¼; larg. 1⅝.

(H. cuspidatus, *Kunz.*, *Germ.* Long. 3; larg. 2. Short, ovate, densely punctured, shining, ferruginous or brown; thorax ferruginous, slightly darker on anterior and posterior margins; external margin of elytra and two transverse irregular bands dark brown; apex lengthened into a point. France, Italy, Germany.)

4. H. pictus, *Fab., Gyll., Steph., Aubé.* Abundant throughout the country. H. arcuatus, *Fab., Panz.* Long. 2½; larg. 1⅓.

(H. fasciatus, *Dahl., Dej. Cat.* Long. 2¾—3; larg. 1½—1¾. Black, almost impunctate; thorax with lateral margins ferruginous; elytra rufo-testaceous, with very narrow border at base; suture, two transverse bands and lateral margin black. France.)

5. H. lepidus, *Oliv., Schon., Aubé.* H. scitulus, *Steph.* Not uncommon in fens, affects muddy ditches and pools.

6. H. confluens, *Fab., Panz., Gyll.* Long. 3½; larg. 2.

(H. nigrolineatus, *Stev.* H. blandus, *Germ.* H. enneagrammus, *Ahr., Sturm.* Long. 4; larg. 2. Shining; head, thorax, elytra, pale yellow; in the latter the suture and four lines clear black; body beneath black; legs testaceous; form longer than H. confluens. Russia and central Europe.)

(H. pallens, *Mannerh.* Long. 3¼; larg. 1⅞. Subconvex, deeply punctured; testaceous; anterior and posterior margins of thorax somewhat darker; elytra somewhat elongate, with two punctured striæ; the suture and a line on exterior margin hardly darker; body beneath black; legs testaceous. Lapland.)

7. H. rivalis, *Gyll., Aubé.* H. fluvatilis, *Steph.* Common in streams in the North of England. Long. 3; larg. 1⅔.

8. H. Sanmarkii, *Sahlb.* H. assimilis, *Gyll., Aubé, Steph.* This insect is absolutely the same as H. rivalis, *Gyll.*, in everything but colour. I believe it will be found to be a variety.

9. H. septentrionalis, *Gyll., Aubé.* H. alpinus, *Kunz., Steph.* Found occasionally with H. rivalis, but more sparingly; it may be distinguished at once by its longer form. Long. 3½; larg. 1⅓.

(H. alpinus, *Payk., Gyll., Germ.* H. bidentatus, *Gyll., Aubé*, ♀. H. borealis, *Gyll.* (?) Long. 4½; larg. 2¼. Closely allied to H. Davisii, somewhat larger; lateral borders of thorax rounded; not so depressed; more narrowed behind; colour not so dark. North of Europe.)

10. H. Davisii, *Curt., Steph., Aubé.* H. borealis, *Aubé, Steph.*, not *Gyll.* Not uncommon in running streams. Cambridge, Norfolk, Lincolnshire. Long. 4; larg. 2¼.

11. H. assimilis, *Payk., Steph.* H. frater, *Kunz., Steph., Aubé.* H. halensis, *Steph. Man.* H. areolatus, *Steph. Ill.* Common. Long. 4⅔; larg. 2½.

(H. hyperboreus, *Gyll.* H. affinis, *Sturm.* Long. 4; larg. 2⅓. Differs from H. assimilis by absence of any spots on elytra caused by confluence of longitudinal lines; on margin of elytra two small linear marks; between first stria and suture rudiment of another stria, always shorter than others. Lapland.)

(H. luctuosus, *Aubé.* Long. 5½; larg. 2⅔. Black; head in front rufo-ferruginous; sides of thorax much rounded; on elytra two large transverse spots at base; two round at margin, nearer the apex; two at the apex; and two oblong near the suture, a little beyond the middle, all pale; at apex denticulated. France, Sardinia.)

12. H. halensis, *Fab.*, *Germ.*, *Erich.*, *Aubé.* H. areolatus, *Dufts.* H. griseostriatus, *Steph.* Long. 4¼—4½; larg. 2⅓—2½. Taken in a deep lake in the Isle of Mull by Mr. Hislop and myself; at Raehills, *Rev. W. Little*: probably to be found in other parts of Scotland.

(H. griseostratus, *Deg.*, *Gyll.* Long. 4¾; larg. 2⅓. Thorax with sides hardly rounded; testaceous, with two dark spots at base; elytra with seven lines more or less confluent; sixth and seventh lines sometimes interrupted, and united again in the form of spots: distinct from H. halensis, *Fab.*, by longer form, thorax narrower, lines on elytra more confluent. Throughout Europe.)

(H. Ceresyi, *Aubé.* Long. 5; larg. 2⅓. Allied to H. griseostriatus, but larger; thorax somewhat broader, posterior angles sharper; elytra with four entire longitudinal lines, and a fifth rudimentary at suture. France.)

(H. canaliculatus, *Dej.*, *Aubé.* Long. 5¼; larg. 2¾. Testaceous, slightly pubescent; thorax with two small dark spots near the base; elytra with six or seven lines and irregular spots; with three longitudinal striæ faintly impressed; elytra broader than thorax; body beneath black; legs testaceous. Spain, France.)

13. H. elegans, *Illig.*, *Panz.*, *Steph.* H. brevis, *Sturm.* H. depressus, *Steph.*, *Aubé.* Not common in Scotland; found in many of the southern counties of England. Long. 5; larg. 2⅔.

(H. marginicollis, *Dej.* A variety, without any black markings, of H. elegans, *Illig.*)

(H. Sansii, *Solier.* Long. 5; larg. 2½. Resembles H. elegans, from which it differs in outline; margin of thorax more rounded; elytra more parallel and compressed; the two teeth at apex of elytra not so acute. Spain.)

(H. depressus, *Fab.*, *Gyll.*, *Steph.* Found in Sweden: is dark beneath, and of a more elongated shape than H. elegans, *Ill.*: it is not ascertained that it is a mere local variety.—Schaum, in Zool. 1891.)

14. H. duodecim-pustulatus, *Fab.*, &c. Scotland; throughout England; I found a black variety in profusion in the Isle of Bute,

September, 1854, also in a small stream in Isle of Man: Mr. Newman has found the same variety at Leominster. Long. 6; larg. 3.

15. H. parallelogrammus, *Ahr.*, *Sturm* ♂, *Aubé* ♀, *Erich.* ♂ ♀. H. lineatus, *Marsh* ♀, *Steph.* ♂ ♀. H. consobrinus, *Kunz.*, *Aubé* ♂. H. nigrolineatus, *Kunz.*, *Sturm.* In profusion near Sheerness; Southend, Norwich, Ipswich, Wandsworth Common. Long. 5; larg. 2⅔.

16. H. novem-lineatus, *Rudd*, *Steph. Ill.* H. nigro-lineatus, *Gyll.*, *Steph.*, not *Stev.*, *Aubé.* H. consobrinus, *Zetterst.* ♂. H. Schönherii, *Aubé* ♂. H. parallelus, *Aubé* ♀. Bute, Sept., 1854; not common; two specimens from gravel-pits, Weyhill, Oct., 1828. Long. 4; larg. 2.

17. H. picipes, *Fab.*, *Gyll.*, *Steph.*, *Aubé.* H. alternans, *Kunz.*, *Steph. Ill.*: ♀ var. H. lineellus, *Gyll.*, *Aubé.* Occasionally near London; Norfolk, Salop, Devonshire, Southend. I am indebted to my friend Mr. Wollaston for recent examples which he took at Killarney, Autumn, 1854. Long. 5; larg. 2¾.

18. H. dorsalis, *Fab.*, *Gyll.*, *Steph.*, *Aubé.* More frequent than the above. I have taken it freely in Norfolk and Huntingdonshire, also Cambridge Fens; Cantire; near London. This insect varies much in maculation. Long. 4¾—5; larg. 2½—2⅔.

(H. lapponum, *Gyll.* Long. 5; larg. 2½. Somewhat depressed; punctulated; pubescent; size and general outline of H. dorsalis; head, thorax and elytra dark brown; margins of two latter inclined to ferruginous; sides of thorax more rounded than in H. dorsalis. Lapland; "peut-être aussi en Allemagne et en Angleterre.")

19. H. opatrinus, *Germ.*, *Steph.*, *Aubé.* This is one of those unsatisfactory insects, the claims of which for admission to our Fauna rest not upon insufficient but upon too remote authority; I cannot ascertain that it has been taken since 1829, by Mr. Hope, "Netley; Salop." It is a very distinct insect, size of H. dorsalis, black, punctulate, clothed with dark green pubescence; thorax broad and rounded at sides. Taken throughout Europe. Long. 4½—5; larg. 2⅓—2¾.

(H. platynotus, *Germ.* H. murinus, *Sturm.* Long. 4¼; larg. 2½. Allied to H. opatrinus, which it closely resembles in colour and punctuation; it is always smaller, comparatively broader, more depressed; margin of thorax continued in almost the same line as that of margin of elytra; and not forming an angle with it, as in H. opatrinus.)

(H. Aubéi, *Muls.* Long. 4½. Dark red-brown; thorax as large as base of elytra, and does not form an apparent angle with it: differs from H. platynotus in its more parallel form; more depressed; sides of thorax less rounded; punctuation of elytra more decided, of head and thorax more fine. France.)

20. H. latus, *Steph.*, *Curt.* H. ovatus, *Sturm*, *Erich.*, *Aubé.* H. castaneus, *Heer.* Long. 4¾; larg. 2¾. Marston Lodge, Yorkshire, *Rev. G. T. Rudd:* "Ouseburn in July," *Bold's Catalogue of Northumberland Insects;* Mr. Bold, who has recently taken it, has kindly supplied my cabinet with examples.

21. H. palustris, *Linn.*, *Sturm*, *Steph.*, *Erich.* H. sexpustulatus, *Fab.*, *Gyll.*, *Aubé.* H. lituratus, *Fab.*, *Panz.* H. proximus, *Steph. Ill.* H. cambriensis, *Steph.*, *Curt.* The most common, and also one of the most variable of our Hydropori: I have specimens from Argyleshire perfectly black. Long. 4; larg. 2.

22. H. vittula, *Erich.* H. ambiguus, *Aubé.* H. nigrita, *Steph.* Nowhere abundant; sparingly in Norfolk, May, 1854; near Oban; Whittlesea Mere; occasionally near London. Long. 2⅔; larg. 1¾.

23. H. xanthopus, *Steph.* H. planus, *Steph. Man.* H. flavipes, *Steph. Ill.*, not *Fab.* H. lituratus, *Brullé*, *Aubé.* In abundance at Southend; near London; Hertford, Ripley, Norfolk, Wandsworth Common, Ely. Long. 3½—3¾; larg. 1⅘—2.

(H. limbatus, *Dalh.* Long. 4¼; larg. 2⅓. Allied to H. xanthopus; differs in its markings on elytra; may also be distinguished by its larger size, more abundant pubescence; anterior of head and sides of thorax more distinctly ferruginous; antennæ entirely testaceous. France.)

(H. analis, *Aubé.* Long. 3¾; larg. 1⅚. Differs from H. xanthopus in its markings on elytra; transverse band at base of elytra not so broad, or represented by one or two spots; more narrow form; pubescence more abundant: differs also from H. xanthopus and H. limbatus by punctures on abdomen, which are close and frequent, whereas in these two species they are rare and isolated. France.)

(H. marginatus, *Dufts.*, *Aubé*, *Fairmaire.* Long. 4½. Head black, vertex and anterior red; thorax black, with broad, testaceous or ferruginous lateral margins; elytra dark brown or reddish; at their base a testaceous broad irregular transverse band, which is continued along the margins of elytra; body beneath black; legs ferruginous or testaceous. France, Germany, Spain. This species I took in England at Woburn Sands, Bedfordshire, September 3, 1848. I do not, however, introduce it into our lists until it has actually been compared with examples in the foreign cabinets.)

(H. Marklini, *Gyll.*, *Zett.* Long. 3¼; larg. 2. Head testaceous, ferruginous on sides and behind; thorax testaceous, with anterior and posterior margins broadly black; elytra black, with broad irregular griseous fascia across the base, into which run five or six abbreviated longitudinal lines of same colour; sides of elytra griseous. Sweden.)

24. H. pubescens, *Gyll.*, *Aubé.* H. melanocephalus, *Marsh*, *Steph.*, *Sturm.* H. caliginosus, *Steph. Man.* H. planus, *Marsh.*, *Steph. Illust.* Dr. Schaum retains with propriety the name of H. pubescens for this species (although H. melanocephalus, *Marsh.*, has the claim of priority), in order to avoid confusion with H. melanocephalus, *Gyll.*, *Aubé*, a very distinct species, which has not yet received any other name. Long. 3½; larg. 1¾.

25. H. melanocephalus, *Gyll.*, *Aubé.* Long. 3¾; larg. 1⅚—2. Black, punctulate, hardly shining; sides of thorax very slightly rounded, continued in same line with sides of elytra; elytra rounded towards the apex; legs ferruginous, feet black; body beneath black. I took this species on the hills behind Oban, September, 1854, in swampy ground caused by one of the hill rivulets; had it not been night, when I could not distinguish the insects in my net, I might have no doubt taken many: it will probably be found elsewhere.

(H. glabriusculus, *Sahlb.* Long. 3¼; larg. 1½. Allied to H. melanocephalus in every respect, of which I believe, so far as I can gather from descriptions, that it may prove a variety; much smaller in size; proportionally somewhat narrower; feet testaceous; legs ferruginous. Lapland.)

26. H. erythrocephalus, *Linn.*, *Fab.*, *Gyll.*, *Steph.*, &c. H. deplanatus, ♀, *Gyll.*, *Aubé.* Long. 4; larg. 2. Very common throughout Great Britain.

27. H. nigrita, *Fab.*, *Gyll.*, *Aubé.* H. trivialis, *Steph.* Long. 3—3½; larg. 1¾—1⅚. This species is, by some accident, omitted in Schaum's valuable list of our British species (Zool. 1892). Southend; near London, by Dr. Power; Norfolk, Cambridge, Northampton. "Dollar, Edinburgh, Paisley."—*Murray's Catalogue.*

(H. brevis, *Sahlb.* Long. 2¾; larg. 1½. Closely resembles in form H. nigrita, is half the size; no trace of longitudinal lines on elytra. Finland. *Var.* of H. nigrita. ?)

(H. neuter, *Fairmaire.* Long. 3⅓. Allied to H. nigrita, same colour, slightly larger, more elongated; head anteriorly reddish, finely punctured; sides of thorax continuing in same line as those of elytra, fully and distinctly punctured: elytra as in H. nigrita, more pubescent. This species differs from H. melanarius by its form, not parallel, less depressed, punctuation more fine; from H. melanocephalus by its form, not parallel, less elongated, smaller size and pubescent elytra. France.)

(H. nivalis, *Heer.*, *Fairmaire.* Long. 3—4. Much resembles H. nigrita and H. melanocephalus; differs from H. nigrita by its larger size, more elongated form, suture always punctate at base, head black, legs more obscure; differs from H. melanocephalus by its smaller head, thorax uniform in punctuation, elytra not parallel, their sides somewhat broader at base than base of thorax. France.)

28. H. erythrocephalus, *Linn.*, *Fab.*, *Gyll.*, *Aubé.* H. deplanatus, *Gyll.*, *Aubé*, var. ♀. One of our most common species. Long. $4\frac{1}{4}$; larg. $2\frac{1}{6}$.

(H. vagepictus, *Fairm.* Long. 4. Much resembles H. erythrocephalus, more convex, more narrow behind; thorax forms with base of the elytra a more distinct angle; lateral band of elytra larger and more distinct: differs from H. rufifrons by its more oval form, less parallel sides of elytra, head larger, thorax less narrowed in front, punctuation not so deep, and by the angle of thorax with sides of elytra. France.)

29 H. rufifrons, *Dufts.*, *Gyll.*, *Sturm.* H. piceus, *Steph.* I have taken this species in the Huntingdonshire Fens and near Cambridge: it is by no means common: Norfolk; Berwickshire, rare; occasionally near Paisley. Long. 5; larg. $2\frac{1}{2}$.

30. H. oblongus, *Steph.* H. nitidus, *Sturm*, *Erich.*, *Aubé.* This insect is to be taken in abundance only in the very early spring, or even before spring has appeared: I took it very sparingly round Horning, Norfolk, in May, 1854. Long. $4\frac{1}{2}$; larg. $2\frac{1}{4}$.

31. H. ferrugineus, *Steph.* H. victor, *Aubé.* Long. 4; larg. 2. The only known localities for this species are near Collingbourne Wood, once in 1828, and several in a stream at Kimpton during the spring of 1829: it resembles H. memnonius, but has thorax more rounded at sides, is more parallel in form. It is taken in France, Constance, &c.

32. H. melanarius, *Sturm*, *Erich.* Long. $3\frac{3}{4}$; larg. 2. Resembles somewhat H. melanocephalus, *Gyll.*, but may be distinguished at once by its more parallel sides; head and thorax decidedly larger, elytra continuing exactly the line of the thorax, and covered with deeper and more distinct punctuation; colour more brilliant black; legs and antennæ entirely ferruginous. I took two examples of this insect in Horning Fen, 1854.

33. H. memnonius, *Nicolai*, *Erich.*, *Aubé*, *Steph.* H. subelongatus, *Steph.* ♂. H. marginatus, *Steph.* ♂ immature, not *Dufts.*, *Aubé.* H. deplanatus, *Steph.* ♀, not *Gyll.*, *Aubé.* H. niger, *Sturm* ♂. H. jugularis, *Bab.* ♂ ♀. H. castaneus, *Aubé* ♀. Long. 4; larg. 2. Abundant occasionally: Southend; near Peterborough; Whittlesea; near London; Daventry, Newcastle; Raehills, Dollar, Kinross-shire, Tweed.

34. H. Gyllenhalii, *Schiödte.* H. rufifrons, *Steph.*, not *Dufts.* H. piceus, *Aubé*, not *Steph.*, *Sturm* or *Erichson.* Long. 4; larg. 2. Occasionally throughout the country, more abundantly in the northern counties; common in Cantyre; Dalmeny, *Rev. W. Little.*

(H. incertus, *Dej.* Long. 4; larg. 2. Size and form of H. Gyllenhalii, which it closely resembles, and of which it may be but a variety; it is, however, rather more depressed, deeper black, more brilliant, more finely punctured, elytra with two longitudinal lines of points; sides of thorax not so full and rounded, more oblique. France and South Europe.)

35. H. tristis, *Payk.*, *Gyll.*, *Sturm*, *Erich.*, *Aubé.* Long. 3⅕; larg. 1⅔. This species, of which Schaum found but two examples in Stephens's collection, is generally distributed, though somewhat local and rare: I have taken it in Lancashire; in Argyleshire; in Mull; "not common near Prestwick Carr," *Mr. Bold:* it seems to affect especially peaty soils on moors and sides of mountains.

36. H. elongatulus, *Sturm.* Long. 3¼. Closely allied to H. tristis, but differs from it by its more compressed, less oval form, elytra rounded at sides, more distinctly pubescent, thorax somewhat narrower;* appears to vary very considerably in size. This species was first detected by my friend Mr. Wollaston, who took a few specimens on Midgley Moor, Yorkshire: I have taken it since in Derbyshire, and previously in Scotland. It is not an uncommon species.

(H. striola, *Gyll.* Long. 3⅕; larg. 1⅔. Of somewhat the form of H. tristis, more depressed, more finely punctuate, and distinguishable by the colour of the elytra; thorax as in H. tristis. Elytra of H. tristis, according to Aubé, are "castaneo-brunnea," "d'un brun ferrugineux;" of H. striola "fusco-brunnea," "brunnâtres;" the latter has a transverse fascia at base of elytra, and exterior lateral band of dark brown; within this band is a dark longitudinal spot near the centre. France, Germany, Sweden.)

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* According to Fairmaire, the colour is dark brown or brown: this is the case in some of my examples, but in the majority it is deep black.

(H. notatus, *Sturm*. Long. 3⅓; larg. 1⅔. Resembles in colour and general appearance H. striola, but differs essentially in outline; it is narrower, and more parallel in form, and the punctuation of elytra more distinct. Berlin.)

(H. neglectus, *Schaum*, *Fairmaire*. Long. 2½. Oval, slightly elongated; depressed towards suture of elytra: differs from H. tristis by smaller size, more contracted, sides of elytra more compressed, forming a more distinct angle with sides of thorax: distinct from H. umbrosus by its form, longer, somewhat more depressed, sides of thorax more fully rounded, forming an angle with base of elytra; elytra less pubescent and more finely punctuate. France.)

37. H. angustatus, *Sturm*, *Erich.*, *Aubé*. H. tristis, *Steph.*, not *Payk.* H. acuminatus, *Sturm*. Long. 3¼; larg. 2⅔. In abundance in Gravesend Marshes in the spring: Sheerness; not uncommon throughout all the fen districts; "Prestwick Car, elsewhere near Newcastle," *Mr. Bold;* "near Swinton, Berwickshire; Raehills," *Mr. Murray.*

38. H. obscurus, *Sturm*, *Erich.*, *Aubé*. H. tristis, *var. β.*, *Gyll.* H. umbrosus? *Steph.* Long. 3; larg. 1⅚. Argyleshire, near Connell Falls, plentifully; near Killarney, by Mr. Wollaston.

39. H. umbrosus, *Gyll.*, *Sturm*, *Aubé*, *Erich.* H. minutus, *Steph.* Long. 2¾; larg. 1⅝. Local. Not common near London. I took several specimens in Norfolk, May, 1854, in a muddy swamp; sparingly near Paisley.

40. H. Scalesianus, *Steph.* H. pygmæus, *Sturm*, *Aubé*. Long. 2; larg. ⅞. There is but one British example of this insect in existence, in the cabinet of the late Mr. Stephens; Mr. Scales, its discoverer, resided at Beechamwell, near Swaffham, Norfolk, a high chalk district; it has been taken in abundance near Berlin by Erichson, but is very local.

41. H. lineatus, *Fab.*, *Oliv.*, *Gyll.*, *Sturm*. H. ovatus, *Fab.* H. pygmæus, *Fab.*, *Steph.* H. ovalis, *Marsh.*, *Steph.* Long. 3¼; larg. 1¾. Common.

42. H. flavipes, *Oliv.*, *Aubé*. H. minimus, *Steph.*, not *Scop.* H. concinnus, *Steph.* H. marmoratus? *Bakewell*, *Steph.* Long. 2¾; larg. 1⅓. Local: taken by Mr. Wollaston in Ireland and Anglesea; occasionally near London; Devonshire.

(H. meridionalis, *Aubé*. Long. 2⅓; larg. 1¼. Closely allied to H. flavipes, smaller, narrower, more convex, may be distinguished at once by the colour of the thorax; testaceous, with the posterior and anterior margins of a dark brown colour, which meets sometimes in the middle of the disk.)

43. H. granularis, *Fab.*, *Gyll.*, *Steph.*, &c. Long. 2½; larg. 1¼. Common.

44. H. geminus, *Fab.*, *Gyll.*, *Steph.*, &c. H. pusillus, *Fab.* Long. 2½; larg. 4. Common in shallow muddy water in the Fen districts. Wimbledon Common, Coombe Wood, Gosforth.

(H. varius, *Dej.* Long. 2½; larg. 1⅓. Black, slightly pubescent; margin of thorax ferruginous; elytra ferruginous, with base, band along suture dilated on either side at the middle, and again near apex, black; on the shoulders a black mark, and another oblong one on the disk, bounded by a narrow line along the margin of elytra. France, Germany.)

45. H. unistriatus, *Ill.*, *Oliv.*, *Steph.* H. parvulus, *Payk.*, *Gyll.* Hyg. bisulcatus, *Curt.* Long. 2⅕; larg. 1⅕. A rare species apparently: one specimen near Cambridge; Devonshire; occasionally near London.

(H. bicarinatus, *Clairv.* Hyph. costatus, *Gyll.* Long. 2⅕; larg. 1⅓. Broader than H. unistriatus, markings somewhat similar, but more testaceous in colour. France.)

(H. pumilus, *Dej.* Long. 2⅙; larg. 1⅓. Broader than H. unistriatus, markings somewhat similar, but more testaceous in colour; distinguishable from H. bicarinatus by sides of the thorax somewhat more rounded, anterior and posterior margins more broadly black; this colour hardly reaches lateral margins. France.)

46. H. minutissimus, *Germ.*, *Aubé.* H. trifasciatus, *Woll.* Long. 2; larg. ⅞. This at present is exclusively an Irish species: it was taken some years ago in the rivers near Cork by the late Mr. Clear; and described by Mr. Wollaston as H. trifasciatus in the 'Annals of Natural History.' The species is not uncommon in France and other countries, and may probably be detected again by any one who will search the Cork district.

Genus HALIPLUS.

1. H. elevatus, *Panz.*, *Gyll.*, *Steph.*, *Aubé*, *Erich.* Rather a local insect: running streams near Bexley; sparingly in the reservoir near Daventry; Ouseburn and Boldon; Mr. Newman takes it in the canal at Leominster; also occasionally in Scotland.

2. H. mucronatus, *Steph.* H. parallelus, *Bab.* H. badius, *Aubé.* Long. 4⅕; larg. 2⅕. We know but little of this insect: Aubé took it very abundantly in September. Compiègne.

3. H. fulvus, ***Fab., Clairv., Babington, Erichs., Steph. Man.*** H. ferrugineus, *Gyll., Aubé.* H. ferrugineus, var., *Steph. Ill.* Long. 4; larg. 2⅓. In abundance occasionally in the Fens: not uncommon.

(H. guttatus, *Dahl., Aubé.* Long. 3⅘; larg. 2. Allied to both of the above species. Differs from H. fulvus, *Fab.*, by its longer form; thorax with a transverse line at posterior margin of very large, almost black, punctures: differs from H. mucronatus, *Steph.*, by smaller and more compressed head and eyes, and by the invariable presence of markings, which are more cloudy than those of H. fulvus, on the elytra. France.)

4. H. flavicollis, *Sturm, Aubé.* H. impressus, *Erich., Steph. Illust.* H. ferrugineus, *Steph., Bab.*, not *Linn.* Long. 4⅕; larg. 2⅕. Near London; Norfolk, Bottisham, Northampton; near Lincoln.

5. H. variegatus, *Sturm, Erich., Aubé.* H. subnubilus, *Bab.* H. marginepunctatus, *Steph. Ill.*, not *Panz.* H. ruficollis, *Steph. Man.*, not *Degeer, Erich.* Long. 3½; larg. 2¼. Cambridge, Huntingdon, Norfolk; not common near London.

6. H. cinereus, *Aubé, Erich., Schiödte.* H. affinis, *Steph.* Long. 3¼; larg. 2. The disposition of the striæ on elytra is the same as in H. flavicollis, but the punctures are closer, smaller and more frequent in each stria; differs also by its smaller size, by the cloudy markings on elytra, and by the irregular punctuation of thorax; differs from H. ruficollis, *Dej.*, by the absence of striæ at the base of thorax, and by the markings on the elytra, which are always less distinct; it is also broader in form, with more parallel sides; more rounded at the apex than H. ruficollis.

7. H. ruficollis, *Deg., Erich., Steph. Illust.* H. impressus, *Gyll., Aubé.* H. marginepunctatus, *Panz.* H. fulvicollis, *Steph. Man.* H. melanocephalus, *Steph. Illust.* H. brevis, *Steph.* H. rubicundus, *Bab.* Long. 2¾; larg. 1¾. Abundant.

8. H. fluviatilis, *Aubé, Erich., Steph.* Long. 3; larg. 1⅘. Dr. Schaum detected two examples in Mr. Wollaston's cabinet: it appears to be closely allied to H. ruficollis, *Dej.*, to be brighter in colour; the small lines on elytra which compose the transverse bands are never confluent; it is larger, longer and less dilated at the shoulders; it frequents rivers and running water, the former pools and stagnant ditches.

9. H. obliquus, *Fab., Gyll., Steph., Aubé.* Long. 3½—4; larg. 1¾—2. This well-marked species is local, but not uncommon.

(H. maritimus, *Fairmaire.* Long. 3½. Colour and markings as preceding, from which it is readily distinguished by its more dilated form, and a black transverse band at the base of thorax; the markings on elytra are somewhat differently arranged; apex less acute. Ostend; brackish water.)

10. H. confinis, *Steph.* H. lineatus, *Aubé, Erich.* Long. 3¼; larg. 2. Allied to, and often confounded with, H. obliquus; smaller, narrower, more obtuse; thorax with a small longitudinal stria on either side near the margin; the dark lines of the striæ of elytra are less interrupted, so that the markings on the elytra are less distinct and well defined.

11. H. lineatocollis, *Marsh, Gyll., Steph., Aubé.* H. bistriolatus, *Dufts.* Long. 3; larg. 1⅔. The black anterior margin of thorax, and longitudinal line (which sometimes is an ill-defined cloud) along the centre of its disk, sufficiently point out this abundant species.

Genus GYRINUS.

1. G. marinus, *Gyll., Ahr., Erich., Aubé.* G. natator, *Fab.*, not *Linn.* G. æneus, *Steph.*, not *Aubé.* G. æratus, *Steph.* G. dorsalis, *Gyll.*, var. Taken throughout Great Britain.

2. G. natator, *Linn., Gyll., Steph.* G. substriatus, *Steph.* Abundant.

(G. nitens, *Suff.* G. æneus, *Aubé.* Long. 5½—7; larg. 3½. Of the form, tint and punctuation of G. natator, from which it differs by the dark metallic colour of the lower part of the body, and also by the extremity of the elytra, of which the external angle is straight, not rounded: it is also allied to G. marinus, from which it is distinguished by its greater convexity, its colour more metallic and brilliant, and by the lines of points, of which those nearer the suture are less perceptible. Italy, Spain, middle of France; erroneously quoted as British.)

(G. distinctus, *Aubé, Fairmaire.* Long. 6¾; larg. 3⅓. Head and thorax the same as G. natator; it differs by its form, more elongated, somewhat less convex, breast and last ventral segment piceo-ferruginous. The whole of Europe.)

3. G. minutus, *Fab., Gyll.*, &c. Not common. Devonshire; near London; Netley; near Newcastle; water of Leith; near Edinburgh; Paisley: I took a fine series in a lake in Mull.

4. G. bicolor, *Payk., Gyll., Curt., Steph.* G. angustatus, *Aubé.* Norfolk, Suffolk; Sheerness, in abundance; salt lakes in Devonshire.

5. G. urinator, *Illig., Aubé.* G. lineatus, *Steph.* Slapton Ley: I have also received specimens from Mr. Bold, from Ouseburn.

Genus ORECTOCHILUS.

O. villosus, *Fab., Gyll., Steph., Aubé.* G. Modeeri, *Marsh.*

I have thus endeavoured to place in their natural position, side by side with recognized British species, such foreign species of Hydrocantharidæ as have not yet been discovered here, but whose locality or latitude leads us to hope that they may eventually be added to our lists. At some future time I may be able to investigate in a similar manner the British and Continental species of the Philhydrida—a group equally interesting, but equally unknown.

HAMLET CLARK.

Northampton, September, 1855.

PROCEEDINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY.

September 3, 1855.—JOHN CURTIS, Esq., President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be given to the donors:—'The Journal of the Society of Arts' for August; by the Society. 'The Literary Gazette' for August; by the Editor. 'The Athenæum' for August; by the Editor. 'Proceedings of the Royal Society,' Vol. vii., No. 14; by the Society. 'Revue et Magasin de Zoologie,' 1855, Nos. 1 and 7; by the Editor, M. Guèrin Méneville. 'Lettre addressée à M. Jacquelin du Val,' par M. H. Jekel, sur le Barypeithes rufipes (Extrait des Annales de la Soc. Ent. de France); by the Author. 'List of the Specimens of Lepidopterous Insects in the Collection of the British Museum,' by Francis Walker, F.L.S., Part iv., Lepidoptera Heterocera; by the Author. 'Entomologische Zeitung,' May to August; by the Entomological Society of Stettin. 'Recueil d'Observations de Zoologie et d'Anatomie Comparée,' par Al. Humboldt et A. Bonpland, texte; presented by the President. 'Nouveau Genre de Carabiques, de la Tribu des Carabides;' 'Description de Seize Espèces de Longicorns du vieux Calabar, à la côte occidentale d'Afrique;' 'Description de Vingt et une Espèces Nouvelles de Coléopterès Longicorns;' all by the Author, Mons. A. Chevrolat. Twenty species of British Lepidoptera; by F. Bond, Esq.

Exhibitions.

Mr. Foxcroft sent from Perthshire some of his captures of Coleoptera, consisting chiefly of Brachelytra.

Mr. Douglas exhibited Elachista Brunnichiella bred from larvæ mining leaves of Clinopodium vulgare; Lithocolletis comparella, reared from a leaf of Lombardy Poplar, from Mickleham; and a pair of Gelechia maculiferella, taken *in cop.* on a window of his house at Lee.

Mr. Waring exhibited some remarkable varieties of Boarmia repandaria, Tephrosia crepuscularia and Anticlea rubidata; all from the neighbourhood of Coomb Hurst, Croydon.

Mr. Edwin Shepherd exhibited a specimen of Leucania musculosa (L. nervosa, *Haw.*), captured near Brighton by Mr. J. N. Winter.

Mr. Westwood said that during a recent visit to Plymouth he had captured Aëpus marinus on the shore; and under some sea-weed he saw, but could not catch, a minute Dipteron, which he had little doubt belonged to the genus Clunio.

Mr. Westwood called the attention of the meeting to three new works by Dr. Burmeister, which he had just received. The first, intituled 'Uebersicht der Brasilianischen Mutillen,' a monograph of the Mutillidæ, would include, besides the species described by Dr. Klug in the 'Nova Acta,' all those discovered by Dr. Burmeister himself in Brazil. The second, 'Untersuchung über die Flügeltypen der Coleopteren,' treated of the venation of the wings in Coleoptera, an Order hitherto very partially investigated in this respect. The third, 'Kritische Bemerkungen über M. S. Merian's Metamorphoses Insectorum Surinamensuim,' which would be enriched in its progress by the author's researches into the natural history of insects made during his residence in Brazil.

The President said that during a recent tour on the Continent he had learned that the third volume of Professor Lacordaire's 'Suites á Buffon' was nearly ready; also that M. Candèze had collected a large amount of material for his monograph on the Elateridæ, and still hoped to receive from English entomologists the assistance he had asked, and that they were so well able to afford.

Mr. Haliday, at the request of the President, gave some account of the matters of entomological interest that had come under his notice during the Continental tour he had recently made in his company. That which had especially attracted his attention was an adaptation of a microscope to a camera obscura by Herr Weinnertz, of Crefeld, whereby the image of an object was thrown upwards on to a horizontal surface of glass, and a drawing on tracing-paper was made with great facility. For copying the venation of wings it was especially useful, and had been extensively employed by Herr Weinnertz; Mr. Haliday esteemed it a preferable and far more easy method than the camera lucida.—*J. W. D.*

Birds killed by Cold.—I have this year, for the first time in twenty years, missed the nightingale from my grounds. I generally have two nests at least, and three weeks' beautiful song; but this year I have had neither, and I should be glad to hear from your correspondents if they have had like misfortune, and if we are to attribute this loss to the cold weather. I did not observe any deaths among the swallows; but I think most of our tenderer birds suffered severely. I picked up a male and female bullfinch in my shrubbery at the point of death about pairing time.—*C. R. Bree; Stricklands, Stowmarket, September* 8, 1855.

Occurrence of the Bee-eater (Merops apiaster) *in the Isle of Wight.*—Lieutenant E. J. B. Edwards, of the Royal Engineers, shot in June last, at Weston, Freshwater, a splendid specimen of the bee-eater. This was communicated to me by Mr. Murrow, of the Royal Albion Hotel, Freshwater Gate, at whose house Lieutenant Edwards, was staying at the time, and who saw it in the flesh. I also saw the person who skinned it, viz. Mr. Rogers, bootmaker and naturalist, Freshwater, Isle of Wight.—*John Dutton; St. Peter's Place, Hammersmith, September* 15, 1855.

Disappearance of the Chough (Pyrrhocorax graculus) *from the Isle of Wight.*—These birds were formerly very plentiful in the Isle of Wight, building about the high cliffs from the Needles to the Freshwater Gate, but are now, it is supposed, reduced to a pair or two: the last known to be killed was caught in the rabbit-warren at Headon, Alum Bay, about two years since. They used to be as common as other crows: a man named Long told me he once killed five at a shot. A family named Lea were nearly poisoned by eating them twenty years since: this was told me by Lea himself (a coast-guard man), who partook of them.—*Id.*

White Swallow.—Last evening I saw a swallow flying over my garden that appeared to be pure white all over. I could not see any other colour whatever.—*Henry Doubleday; Epping, August* 20, 1855.

Occurrence of Crossbills in Northumberland and Durham.—During the summer a great many crossbills (*Loxia curvirostra*, Linn.), have visited our district: they were in the greatest numbers during August, and were generally in parties of six or seven. A friend of mine, who shot a good many of them, is of opinion that they had been bred here, as they were in such plumage as to render their coming from a distance very improbable.—*Thomas John Bold; Angas' Court, Bigg Market, Newcastle-on-Tyne, September* 4, 1855.

On the Doubled-broodedness of Gonepteryx Rhamni.—Although I am not the Mr. Bree who has raised this point for discussion, I have a word or two to say on the subject. I think Mr. Douglas is hasty in his remarks about the want of practical knowledge in the Rev. Mr. Bree's observations. It is a very fair inference, and one very generally drawn by "practical entomologists," that insects appearing in early spring in a wasted condition have hybernated, and *vice versa*, those that are fresh have recently emerged from their pupa stage of existence. A sound inference is as valuable as a known fact; if not Bacon has lived in vain, and the inductive process of reasoning is false. Mr. Douglas proves nothing by his fact, except what was very well known, that the larvæ of the first brood of G. Rhamni are full-grown in June. I *know* that this takes place with other insects, in which the larvæ produce a second brood in the autumn, and I will state a case in point. The first warm, sunny day in May I can always take in one locality in this neighbourhood many specimens of Speranza conspicuaria quite fresh, with their wings covered with those delicate frosty, silvered atoms which impart such beauty to this insect. I *infer* that it has not hybernated, *inter alia*, from its freshness; and my grounds for this inference are—firstly, the broom, upon which the larvæ feed, grows on an exposed hill, far removed from any house or place of shelter; and secondly, if the insect has hybernated, it must have been covered with three or four feet of snow once or perhaps twice in the winter, and consequently exposed to the drenching thaw which succeeds. I have taken it, in different years, upon the 7th and 29th of May and beginning of June, and it is found for about fourteen days, more or less, when it disappears, and the larvæ may be found full grown in the beginning of July. In the beginning of August the second brood appears more numerous than the first, and disappears in about the same time—about fourteen days; the larvæ become full-grown in the late autumn, and pass the winter as pupa—to emerge as perfect insects the following May. Now, knowing this to be true, have I not a right to infer that exactly the same process takes place with G. Rhamni, and that it is equally "double-brooded." I have the greatest possible respect for the opinion of that excellent entomologist, Mr. Doubleday; he has often—very often—been of the greatest possible assistance to me in my entomological pursuits, and it is with much diffidence that I suggest any views in opposition to his, but he will I am sure be glad to have a subject like this publicly discussed. Do insects which hybernate disappear directly they emerge from the pupæ state in autumn, *if the weather is warm?* Or do they only do so upon the approach of winter? I saw and took G. Rhamni this day, September 10. Does the intercourse between the sexes, according to the single-brood theory, take place before or after hybernation? If before, the insect would not look fresh in spring, as it is this process which disturbs the nuptial bloom of insects more than anything else. Depend upon it that hybernation of the imago is an accidental or casual occurrence. It is opposed to the whole scheme of insect life.—*C. R. Bree; Stricklands, Stowmarket, September* 10, 1855.

Is Gonepteryx Rhamni double-brooded?—I have read with much interest the several remarks of Mr. Newman (Zool. 4706), Mr. Doubleday (Id. 4811) and Mr. Douglas (Id. 4812), on the question whether G. Rhamni be double-brooded or not. I entirely coincide in the opinion expressed by them, that it is *not.* If the insect be double-brooded (in the exact meaning of that term), there ought to be *three* "flights" of the insect, it being admitted on all hands that it is seen on the wing in April, or earlier if the season be favourable, and again in the autumn. The first, or, as it may be termed, the midsummer brood, would be produced from eggs laid by the parent insect in April, or earlier, as the case may be. Supposing Rhamnus catharticus to bud about the beginning of May, the larva, by rapid eating, *might* become a pupa at the end of the month, and, by an equally rapid proceeding, *might* become an imago by the middle of June. Let us then turn to *facts.* Has any entomologist ever seen G. Rhamni, fine or otherwise, on the wing, either in June or July? It would be presumptuous in me, on my own individual authority, to deny positively that it has been so seen; but I have collected in Yorkshire, Gloucestershire, Buckinghamshire and Suffolk, and I can confidently affirm, that, as far as my acquaintance with those counties extends, G. Rhamni has never been on the wing in June or July. It lies with the advocates of "double-brooded" to show that it has not only been seen, but seen in *fine condition* during those months. If their proof in this respect fail, the question, as it appears to me, is set at rest. Mr. Stainton asks, "Do not the hybernated females lay eggs in the spring? do not these eggs produce larvæ which feed up in May, and furnish the perfect insect in June? &c.," and adds, "I pause for an answer to these inquiries." He has *my* answer, that *I* never saw the insect on the wing in the month of *June*, though I do not deny that others may. With regard to the circumstance so strenuously urged, and apparently so confidently relied upon, by Mr. Bree and Mr. Hawker, that *fine* specimens are seen in April or earlier, what has this to say to the question. "single or double-brooded?" Do they call these the *first* brood? Brilliant specimens *may* be taken in the spring; but, though I have captured dozens, and seen hundreds on the wing at that season, I have never been fortunate enough to take one worth placing in my cabinet. Conceding the fact, however, nothing can more easily be accounted for. As Mr. Doubleday truly remarks, numbers become quiescent very soon after they have emerged from the pupa state, and appear in spring almost as fresh as when first hatched. In corroboration of this, I may mention the following fact:—Walking out about a fortnight since, I saw a number of pupæ of Vanessa Urticæ, and took home about a dozen: on the 27th of last month one of them produced the insect, about six o'clock in the evening: that night there was a pretty sharp frost, and the insect became apparently torpid: from that date, up to the present moment, it has never stirred, and, when pushed, merely moves a leg: as the sun never shines on the place where it is, I have no doubt it will remain quiescent until next spring. Now, if an insect, immediately after emerging from the pupa, could thus become torpid, even in a *room*, how much more so when exposed to the open air. In conclusion, I have only to state my firm conviction that there is but *one* brood of G. Rhamni in the year.—*Joseph Greene; Brandeston, Woodbridge, Suffolk, September* 5, 1855.

Note on Argynnis Lathonia.—Seeing we are making sundry investigations relative to certain of the Rhopalocera, A. Lathonia amongst the number, I have a question to ask, and I believe in doing so I am stating the wishes of many of my brethren. It is this, that each party who possesses a specimen or specimens of this insect would kindly forward a notice to the 'Zoologist,' stating when he captured them, where they were captured, or how they came into his possession. There has been, it is currently reported, a "job" lot, as the merchants say, distributed amongst various individuals, and which have no more claim to be British than I have to a benefice: their repinning allows them to be easily "seen through," and the flattening out of the abdominal groove also proves them to be an admirable "gull."—*John Scott; South Stockton, September* 7, 1855.

Note on the Breeding of Notodonta dictæoides, &c.—Having heard frequent complaints from entomologists of the difficulty of breeding this beautiful prominent, I beg to make known a method I have tried, and which has proved very successful. It is as follows:—I procured a large flower-pot, and cut it in two, and cut a round hole in a square piece of wood, so as to fit tight round the upper part of the bottom half of the pot. This forms the bottom of my cage, which is made of thin slips of wood about nine inches high, and covered over (including the top) with book-muslin. In light cages of this kind, there is no difficulty in feeding up larva, provided they are kept supplied with fresh food. I fill the pot with fine mould, mixed with rotten wood, from the root of the aspens at Wanstead, leaving a few leaves on the top. When the larvæ have gone down, I take the pot out, and put it in a large cage in my garden, where it stands winter and summer. This last-mentioned cage is of sufficient size to hold four or five pots, is made of wood with painted lines in the sides, back and front, and a slanting wood and fine wire top, which admits of a free circulation of air, and prevents mould. In cages on this plan I have bred all my N. dictæoides that went down last season (ten in number), twenty-seven Asteris, twenty-three Flavicornis, and many other insects.—*William Machin;* 35, *William Street, Globe Fields, Mile End, September* 3, 1855.

Capture of Scolytus destructor in the North of England.—When at Gibside, in the latter end of August last, I was not a little surprised to find seven specimens of Scolytus destructor, in the bark of a felled elm-tree. They were accompanied by numbers of larvæ, in all stages of growth. Whether this was a colony recently founded, or the pest a denizen of our woods, is a question for future observers to determine.—*Thomas John Bold; Angas' Court, Bigg Market, Newcastle-on-Tyne, September* 6, 1855.

The Vinegar Polype.—The French missionaries, Huc and Gabet, seem, from their interesting narrative of a journey through Thibet and China, to have been more skilled in the knowledge of men than of the animal or vegetable world. When in the Province of Kiang-si, three hundred miles from the sea, they describe the want of vinegar to quench their thirst as having been supplied by polyp, the properties of which, they say, were not new to them. "At a guard-house near Nan-tchang-fou, we asked for some vinegar. 'I have some,' said the mandarin; 'it is polypus vinegar, made by the animal itself.' This Tsou-no-dze (vinegar polypus) is a creature that, on account of its extraordinary property of making excellent vinegar, merits particular mention. It is a monstrous assemblage of fleshy and glutinous membranes, tubes, and shapeless appendages, that give it a very ugly and repulsive appearance; you would take it for an inert, dead mass, but when touched it contracts and dilates, and assumes various forms. [It is an animal whose structure and character are not better known that that of the other polypi. This Tsou-no-dze is found in the Yellow Sea, and the Chinese fish for it on the coasts of Leao-tong, but it is rather scarce. Possibly it may be more abundant in some other places, where it is neglected from ignorance of its peculiar property. This polyp is placed in a large vessel filled with fresh water, to which a few glasses of spirits are added, and after twenty or thirty days this liquid is found transformed into excellent vinegar, without going through any other process, and without the addition of the smallest ingredient. The vinegar is as clear as spring water, very strong, and of a very agreeable taste. After the first transformation, the source appears inexhaustible, for as it is drawn off by degrees for consumption it is only necessary to add an equal quantity of pure water, without any more spirit, and the vinegar remains equally good. The Tsou-no-dze, like the other polypi, is easily propagated by germination; you detach a limb, which vegetates and grows, and in a short time is found to possess the same property of changing water into vinegar. These details are not only based on the best information we have been able to collect, but we ourselves possessed one of these polypi, and kept it for a year, using constantly the delicious vinegar which it distilled for us. At our departure for Thibet, we presented it to the Christians of our mission in the Valley of Black Waters." Can this marvellous animal, said to be fished up in the Yellow Sea, be anything else than the repulsive-looking mass, answering to Huc's description of the Tsou-no-dze, which is found in certain states of acetous fermentation, distinct from the mould that occasionally gathers on the surface, and which in the North of England is called "the mother," in vinegar, &c., as supposed to concentrate all the acid? Whether it is now as productive of agreeable vinegar as the missionary represents his polyp, I am not prepared to assert.—*Charles Fox; Trebah, Falmouth.*

NOTICES OF NEW BOOKS.

'*Annals and Magazine of Natural History.*' No. 93, dated September, 1855; *price* 2*s.* 6*d.* London: Taylor and Francis, Red Lion Court, Fleet Street.

The following are the contents:—

'Observations on the Genera Pachybdella, *Diesing*, and Peltogaster, *Rathke*, two animal forms parasitic upon the abdomen of Crabs.' By Professer Steenstrup. [Extracted from Weigmann's Archiv, 1855, p. 15.]

'Notes on Palæozoic Bivalved Entomostraca. No. II. Some British and Foreign Species of Beyrichia.' By T. Rupert Jones, F.G.S.

'On the Heart and Circulation in the Pycnogonidæ.' By Dr. A. Krohn. [Extracted from Weigmann's Archiv for 1855, p. 6.]

'Abstract of a Monograph of the Family Gorgonidæ.' By M. Valenciennes.

'On the Genus Assiminia.' By Dr. J. E. Gray, F.R.S., V.P.Z.S.

'On the Law which has regulated the Introduction of New Species.' By Alfred R. Wallace, F.R.G.S.

'On some New Species of Hemipedina from the Oolites.' By Thomas Wright, M.D., F.R.S.E.

'Short Biographical Notice of the late Dr. Johnston, of Berwick-upon-Tweed.

Bibliographical Notice:—'The British Flora, comprising the Phænogamous or Flowering Plants, and the Ferns.' The 7th edition, with additions and corrections. By Sir William Jackson Hooker, K.H., D.C.L., &c., and George A. Walker Arnott, LL.D., &c.

Proceedings of Societies:—Royal, Linnæan, Botanical of Edinburgh, Zoological.

Miscellaneous:—Monstrosity of Antirrhinum majus; by Dr. J. E. Gray. Notice on the Horns and Skull of the Arnee; by Dr. J. E. Gray.

In the Proceedings of the Royal Society occurs the report of a paper by Dr. John Davey, intituled 'Some Observations on the Ova of the Salmon in relation to the Distribution of Species.' In this the Doctor gives the result of experiments on ova submitted to various tests, with a view to elucidate the geographical distribution of fishes. The conclusions drawn from the observations are as follows:—

"1. That the ova of the salmon in their advanced stage can be exposed only for a short time to the air if dry, at ordinary temperatures, without loss of life; but for a considerable time, if the temperature be low, and if the air be moist; the limit in the former case not having exceeded an hour, while in the latter it has exceeded many hours.

"2. That the vitality of the ova was as well preserved in air saturated with moisture as it would have been had they been in water.

"3. That the ova may be included in ice without loss of vitality, provided the temperature is not so low as to freeze them.

"4. That the ova, and also the fry recently produced, can bear for some time a temperature of about 80° or 82° in water, without materially suffering; but not without loss of life, if raised above 84° or 85°.

"5. That the ova and young fry are speedily killed by a solution of common salt nearly of the specific gravity of sea-water, viz. 1026; and also by a weaker solution of specific gravity 1016.

"Finally, in reference to the inquiry regarding the distribution of the species of fishes, he expresses his belief that some of the results may be of useful application, especially those given in the second and third sections; inferring, that as in moist air, the vitality of the ova is capable of being long sustained, they may, during rain or fog, be conveyed from one river or lake to another, adhering to some part of an animal, such as a heron or otter, and also during a time of snow or frost; and further, that other of the results may be useful towards determining the fittest age of ova for transport for the purpose of stocking rivers, and likewise as a help to explain the habitats, and some of the habits of the migratory species."

The following note by Mr. Hogg on the fish lately stranded in Tees Bay is from the Proceedings of the Linnean Society:—

"Since my return home, I have had an opportunity of learning more particularly respecting the large fish which was stranded last September in the Tees Bay; and I have now not the least doubt that it was a common tunny, and that too of a large size. One of the fishermen who had seen the fish, on cutting it said—the flesh looked like highly-salted bacon, *i.e.* red with salt or saltpetre. He described it in size as 'being pretty well on to 60 stone,' which, at 8 ℔s. to the stone (meat weight), would give 480 ℔s. The only freshly-killed tunny I ever saw was at Palermo; it was a good-sized fish, and was carried on the shoulders of two strong fishermen, the one walking a few feet before the other. Pennant describes, in his 'Brit. Zool.' (edit. 1812), vol. iii. p. 362, one which was caught at Inverary in 1769 as weighing 460 ℔s. This then would probably be somewhat less than the Tees fish; and this is further shown by the following fact:—Pennant says the tail 'measured 2 feet 7 inches between tip and tip' of its crescent-form. I yesterday measured the tail of the Tees fish, which gave 2 feet 8¼ inches from tip to tip, thus having 1¼ inch more in the width of the crescent-tail than Pennant's, and consequently most likely it was the larger of the two. The fisherman had well preserved the tail, and it presents a beautiful specimen of a crescent, and very perfect, each half corresponding in a very accurate manner with the other. It is covered with a thick, nearly black skin, and quite smooth. I counted the caudal rays, and at first I made nineteen on one side and eighteen on the other; but on recounting them I am more satisfied that they are equal, *i.e.* eighteen on each side or in each half. Between them I noticed most distinctly 'a cartilaginous keel between the sides of the tail,' as described by Cuvier in his generic characters of his genus Thynnus."

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(List of Museum Catalogues continued.)

Fishes. By Dr. Gray.

Cartilaginous Fish. With two Plates. 3s.

☞ The Catalogues of Reptiles and Fishes contain the characters of all the enera and Species at present known: the latter is illustrated with figures of the enera.

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" Longicorns. By Adam White. With Plates. 2s. 6d.

Hemiptera. By W. S. Dallas.

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Homoptera. By Francis Walker.

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☞ Great pains will be taken to make this list, month after month, as perfect as ible, the new publications being carefully incorporated.

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Radiata.—The Vinegar Polype, *Charles Fox, Esq.*, 4873.

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